

18ECC303J
Computer Communication Networks
Sixth Semester

Lab Experiments
AY 2020 – 2021

18ECC303J		
Assessment	List of Experiments planned in Virtual Mode	Virtual Lab link
CT-1	Lab 1: Fabrication of Cables	http://vlabs.iitb.ac.in/vlabs-dev/labs_local/computer-networks/labs/exp1/index.php
	Lab 2: Creation of Peer to Peer Topology (Ring and Mesh)	http://vlabs.iitb.ac.in/vlabs-dev/labs_local/computer-networks/labs/exp2/simulation.php
	Lab 3: Create Star Topology	http://vlabs.iitb.ac.in/vlabs-dev/labs_local/computer-networks/labs/exp3/index.php
CT-2	Lab 4: Implementation of Error detection and Correction using Hamming Codes using VLAB	http://vlabs.iitb.ac.in/vlabs-dev/labs/mit_bootcamp/comp_networks_sm/labs/index.php
	Lab 6: Concept of IPV4 addressing using VLAB.	http://vlabs.iitb.ac.in/vlabs-dev/labs/computer_network/index.php
	Lab 7: Simulation of Distance Vector Routing (DVR) Algorithm using Cisco Packet tracer.	Video Demonstration for installation procedure and experiment conduction
	Lab 8: Simulation of LSR algorithm using Cisco packet tracer.	
CT-3	Lab 9: File Transfer	http://vlabs.iitb.ac.in/vlabs-dev/labs_local/computer-networks/labs/exp7/index.php
	Lab 10: Encryption and Decryption using Ceaser Cipher using VLAB.	http://vlabs.iitb.ac.in/vlabs-dev/vlab_bootcamp/bootcamp/Byte_Karma/labs/exp1/index.html
	Lab 11: Encryption and Decryption using DES using VLAB	http://cse29-iiith.vlabs.ac.in/Experiments.html

LAB 3

CREATION OF STAR TOPOLOGY

Aim of the experiment:

To construct Star Topology.

Theory

The word physical network topology is used to explain the manner in which a network is physically connected. Devices or nodes in a network get connected to each other via communication links and all these links are related to each other in one way or the other. The geometric representation of such a relationship of links and nodes is known as the topology of that network.

These topologies can be classified into two types:

- ❖ Peer to peer
- ❖ Primary - Secondary

Peer to peer is the relationship where the devices share the link equally. The examples are ring and mesh topologies.

In Primary - Secondary relationship, one device controls and the other devices have to transmit through it. For example, star and tree topology.

Features of Star Topology:

- ❖ Every node has its own dedicated connection to the hub.
- ❖ Hub acts as a repeater for data flow.
- ❖ Can be used with twisted pair, Optical Fiber or coaxial cable.

Advantages of Star Topology:

- Fast performance with few nodes and low network traffic.
- Hub can be upgraded easily.
- Easy to troubleshoot.
- Easy to setup and modify.
- Only that node is affected which has failed, rest of the nodes can work smoothly.

Disadvantages of Star Topology:

- Cost of installation is high.
- Expensive to use.
- If the hub fails then the whole network is stopped because all the nodes depend on the hub.
- Performance is based on the hub that is it depends on its capacity.

Pre-Lab Questions:

1. State TRUE or FALSE. A central networking device is required to connect other devices in star topology.
2. Roll over cable is used to connect devices in _____ topology.
3. In Star topology, the central device is called _____.
4. In Star topology, if the central system goes down, it affects the whole system. (True/ False)

Procedure:

The followings steps are carried out to create/ construct a Star topology using hub / switch.

Upon clicking the VLab link (given below), a simulation tab is opened, Simulation area is a blank square area which defines the working area. A series of components would be given for selecting and dropping in the working area for connecting these devices in different topologies.

1. In order to build a topology first select on the component (hub or computer) and then immediately click on the working area to place it
2. To connect between two devices, select the cable and click on the port of first component and then immediately click on the port of second component
3. Once the topology is built then click on the Submit button to test whether the given topology is Star topology or not.

To proceed with the experiment, click on the link to do the simulation in Computer Networks Lab - VLAB, developed by IIT Bombay.

http://vlabs.iitb.ac.in/vlabs-dev/labs_local/computer-networks/labs/exp3/index.php

Simulation:

Simulation window appears as shown below



Fig. 1: Simulation window for Star Topology

The Window consists of computer, hub and different types of cables.

Select the cable type: Straight-Through or Crossover or Roll-over, fiber or coaxial cable.

Each cable is represented through different colour. Five different cables like Straight-Through wire, Crossover wire, Roll over wire, Coaxial cable and Fiber optic are available. In which, Straight-through is Black, Crossover is red, Roll over is Orange, Coaxial is also black in colour but thickness is bigger compared to Straight-through

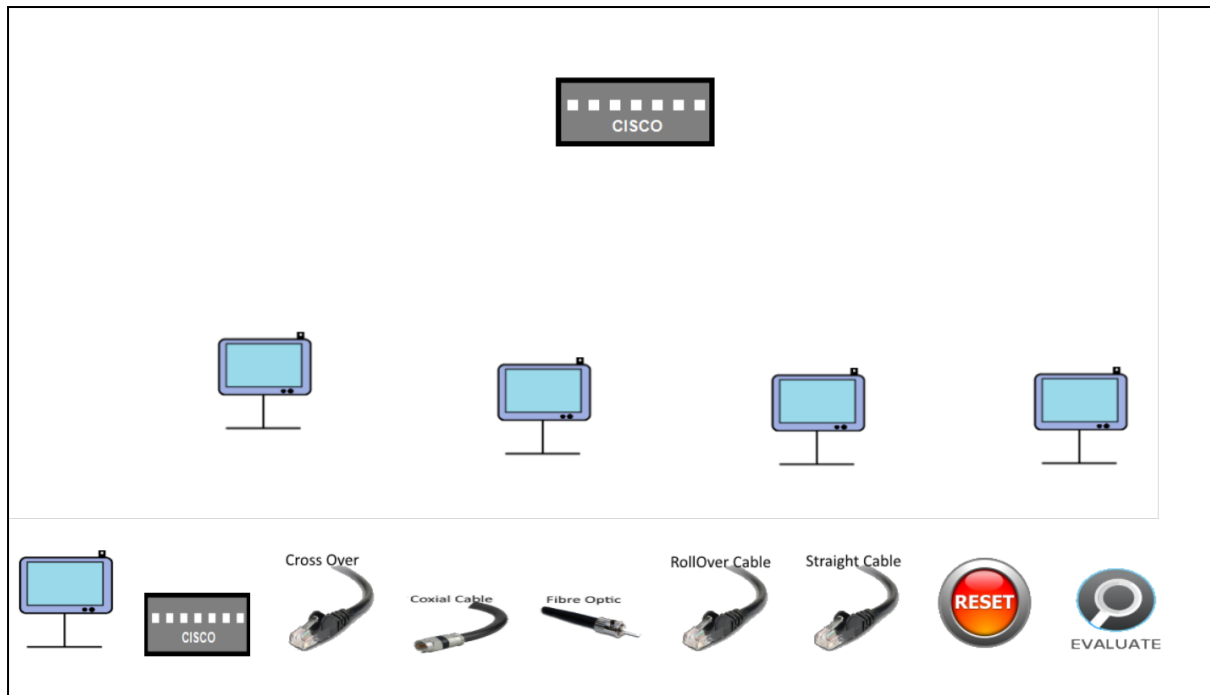


Fig. 2: Computers and hub placed before connecting in star topology.

Note: Maximum 4 computer can be dropped in the window. Then, select the cable type to connect computer to the hub in Star Topology and evaluate the same.

Then, Connect the topology with suitable cable, evaluate whether the computers are connected in star topology or not.

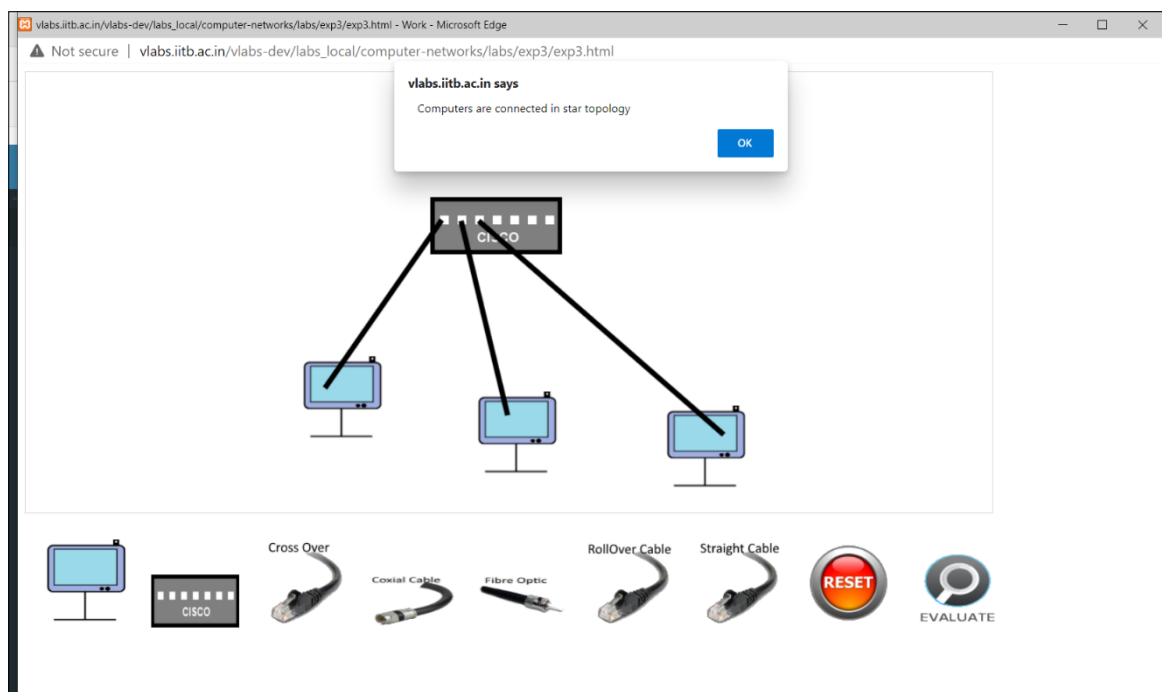


Fig. 3 : Three computers connected through coaxial cable to the hub in Star Topology.

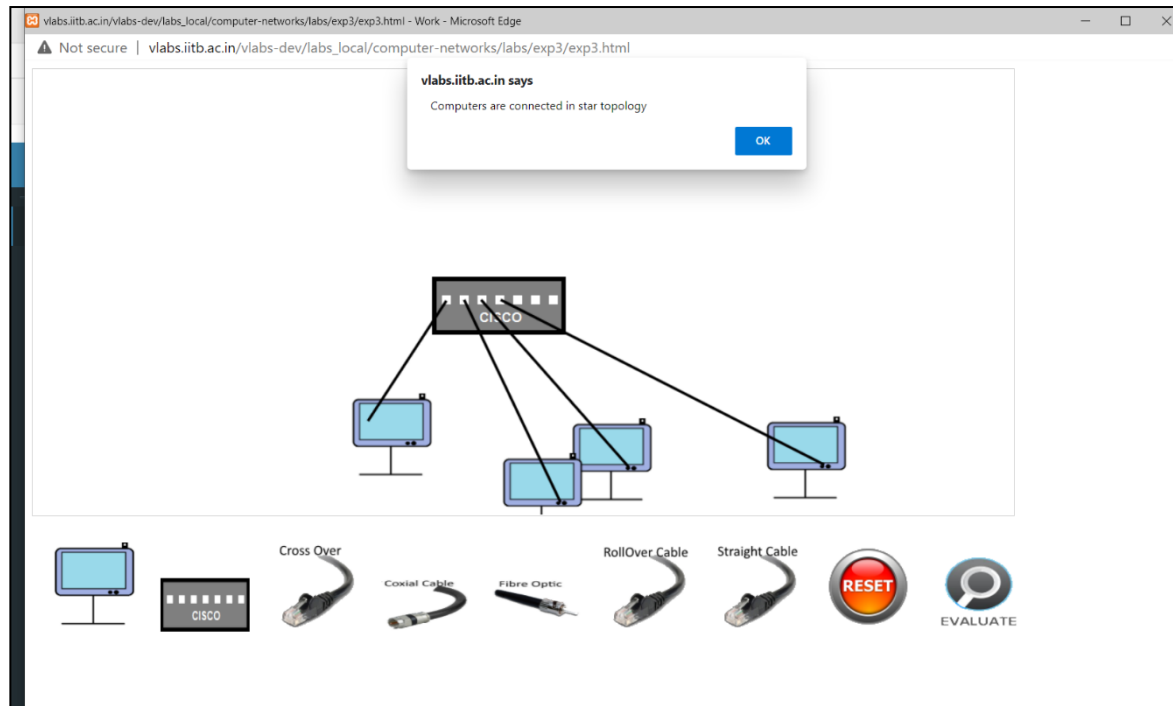


Fig. 4 : Four Computers connected to hub using Straight-through cable in Star Topology.

Similarly, connect the computer to the hub using other cables and evaluate, Also, evaluate the construction of star topology with crossover cable for mesh configuration and evaluate for the same.

Repeat, the connection of computer by using various cables (one computer using cable, other using fibre and so on) to the hub and evaluate whether the computers are connected in star topology or not.

Observe and discuss on the evaluated result.

Post-Lab Questions:

1. Define: Star Topology.
2. Compare Mesh and Star Topology.
3. In Star topology, computers are connected to one another directly, True or False.
4. Mention the applications of Mesh topology.

Result:

Thus, the Star Topology is constructed using different cable types.